NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
PROCUREMENT, ACQUISITION AND CONSTRUCTION
SYSTEMS ACQUISITION FY 2007 OVERVIEW

SUMMARIZED FINANCIAL DATA
($ in thousands)

Procurement, Acquisition and Construction	FY 2005 ACTUALS	FY 2006 CURRENTLY AVAILABLE	FY 2007 BASE PROGRAM	FY 2007 ESTIMATE	INCREASE / DECREASE
OAR					
Research Supercomputing / CCRI	9,363	9,369	9,395	10,379	984
Air Force Radiometer Hurricane Processing	300	0	0	0	0
Subtotal, OAR	9,663	9,369	9,395	10,379	984
NWS					
ASOS	4,608	8,506	4,635	3,935	-700
AWIPS	12,708	13,280	12,764	12,764	0
NEXRAD	10,665	9,343	8,376	8,376	0
NWSTG Legacy Replacement	2,476	493	495	495	0
Radiosonde Network Replacement	6,285	6,299	4,347	4,014	-333
Weather and Climate Supercomputing (WW)	19,322	19,019	19,092	19,092	0
Weather and Climate Supercomputing Backup	7,045	7,050	7,077	7,077	0
Cooperative Observer Network Modernization (WW)	864	4,218	3,739	3,739	0
Cooperative Observer Network Modernization (C)	0	0	495	495	0
NWS Coastal Global Observing System	0	0	1,492	0	-1,492
Complete and Sustain NOAA Weather Radio	0	5,572	5,594	5,594	0
Strengthen US Tsunami Warning Network	10,160	3,796	3,470	1,030	-2,440
All Hazard National Warning Network: NOAA Weather Radio	0	1,998	0	0	0
Subtotal, NWS	74,133	79,574	71,576	66,611	-4,965
NESDIS					
GOES					
Geostationary Systems	301,153	335,322	335,568	439,607	104,039
Subtotal, GOES	301,153	335,322	335,568	439,607	104,039

POES					
Polar Orbiting Systems - POES	104,230	101,261	101,767	89,906	-11,861
Subtotal, POES	104,230	101,261	101,767	89,906	-11,861
NPOESS					
Polar Orbiting Systems - NPOESS	300,528	316,580	317,592	337,870	20,278
Subtotal, NPOESS	300,528	316,580	317,592	337,870	20,278
EOS					
EOS & Adv. Polar Data Processing, Dist. & Archiving Systems	2,958	2,960	990	990	0
Subtotal, EOS	2,958	2,960	990	990	0
CIP					
CIP - Single Point of Failure	2,760	2,798	2,772	2,772	0
Subtotal, CIP	2,760	2,798	2,772	2,772	0
Comprehensive Large Array Data Stewardship Sys (CLASS)	6,448	8,876	6,476	6,476	0
NPOESS Preparatory Data Exploitation	0	4,437	4,455	4,455	0
Subtotal, NESDIS	718,077	772,234	769,620	882,076	112,456
PS					
AMNH	986	0	0	0	0
NOAA ICOSS Observing Systems (NOS)	0	8,876	0	0	0
Convert NOAA Weather Bouys with NDBC (NOS)	0	3,945	0	0	0
Coastal Global Ocean Observing System (NWS)	0	1,477	0	0	0
Strengthen US Tsunami Warning Network (NWS)	0	3,432	0	0	0
Subtotal, PS	986	17,730	0	0	0
TOTAL	802,859	878,907	850,591	959,066	108,475

Office Of Oceanic and Atmospheric Research
Activity: Systems Acquisition

GOAL STATEMENT:

The Office of Oceanic and Atmospheric Research's (OAR) Research Supercomputing goal is to provide a state-of-the-art scalable supercomputer and supporting infrastructure to advance modeling programs that are critical to NOAA's and the Nation's climate research.

BASE DESCRIPTION:

Research Supercomputing/CCRI: This program supports a very large, scalable computer system that provides critical computing, storage, and analysis capabilities, as well as model development and infrastructure support, to NOAA's Geophysical Fluid Dynamics Laboratory (GFDL) to advance the Nation's climate research. This computing program allows NOAA to leverage the world-class research staff and modeling capabilities now in place at GFDL to address important research problems in climate and weather research. The laboratory's on-going model development effort is positioning GFDL to take full advantage of the scalable architectures and to advance the Nation's climate research program through NOAA computational research and collaboration with the inter-agency and academic climate research community.

Base activities support the objectives, "Advance understanding and predict changes in the Earth's environment to meet America's economic, social, and environmental needs" under the Department of Commerce Strategic Goal of "Observe, protect, and manage the Earth's resources to promote environmental needs" as well as the Environmental Modeling objective under NOAA's Weather and Water goal.

PROPOSED LEGISLATION:

None.

SUMMARIZED FINANCIAL DATA

(Dollars in thousands)

Procurement Acquisition and Construction	FY 2005 ACTUALS	FY 2006 CURRENTLY AVAILABLE	FY 2007 BASE PROGRAM	FY 2007 ESTIMATE	INCREASE / DECREASE
Line Item: Systems Acquisition					
Research Supercomputing / CCRI	9,363	9,369	9,395	10,379	984
Air Force Radiometer Hurricane Processing	300	-	-	-	-
TOTAL	9,663	9,369	9,395	10,379	984
FTE	-	-	-	-	-

Note: The dollars in this table represent budget authority.

PROGRAM CHANGES FOR FY 2007:

Research Supercomputing/CCRI (+0 FTE and $984,000): NOAA requests 0 FTE and $984,000 to meet the objectives of the Administration's Climate Change Science Program (CCSP). The CCSP will improve the Nation's understanding of the causes of observed climate variability and change and of ways natural and managed ecosystems can adapt. CCSP also will quantify the forces that bring about changes in the Earth System, reduce uncertainty in projections of how the Earth's climate and related systems may change in the future, and explore ways to manage risks and opportunities related to climate variability and change. A near-term priority for supporting these goals is to acquire additional supercomputing resources to enable the systematic generation of model products needed by the impacts, assessments, and policy communities to document and assess the regional and global impacts of long-term climate variability and change. The requested increase will allow NOAA to meet its CCSP obligations for providing routine, on-demand, state-of-the-science, model-based global projections of future climate.

Statement of Need

Research into expanding the scientific understanding of the physical, chemical, and biological processes that govern the behavior of the Earth System requires a special focus on the development and utilization of large-scale computer simulations for environmental modeling. As part of the Administration's multi-agency Climate Change Science Program (CCSP), NOAA plays a leading role in developing these computer simulations as well as in hosting the High Performance Computing (HPC) systems on which they run. The CCSP was established in February of 2002, and the CCSP Strategic Plan was adopted in July of 2003. The Plan establishes NOAA's Geophysical Fluid Dynamics Laboratory (GFDL) as one of two national Climate Modeling Centers that will coordinate and accelerate climate modeling activities and provide relevant decision support information on a timely basis. Toward this end, the Plan specifically calls for an increase in computational resources to enable systematic generation of model products needed by the impacts and policy communities.

Proposed Actions

NOAA has undertaken a new, holistic, "One NOAA" approach to planning, acquiring, and managing its HPC resources. Under this approach, a unified procurement for HPC resources to support NOAA's Research and Development mission is currently underway. This procurement will substantially improve the portion of NOAA's HPC enterprise that directly supports NOAA's strategic goals in Climate and Weather & Water by enabling its research into the physical processes governing the Earth's climate and weather. The requested increase will fully fund this upgrade to NOAA's climate computing capabilities in FY2007 and is required to fully meet NOAA's obligations for providing climate projections under the CCSP.

Benefits

The increase in climate computing capability will fully support the integration of climate change scenarios that explore the impacts of differing energy, water, and land use options. These demand-driven scenarios would provide crucial support information on a timely basis for policy and management decisions related to climate variability and change in each of the seven research elements in the CCSP. Moreover, the funding increase will advance the development and utilization of comprehensive Earth System Models being developed jointly by NOAA/GFDL (one of the two Climate Modeling Centers identified in the CCSP) and its university partners, including Princeton University and Columbia University. These models are crucial for supporting the demand-driven scenarios to be produced under the CCSP. The comprehensive climate models and the scenarios they produce are both crucial for meeting NOAA's GPRA measures to (1) reduce the uncertainty in model simulations of the influence of aerosols on climate and (2) improve society's ability to plan and respond to climate variability and change using NOAA climate products and information.

Performance Goals and Measurement Data

This increase directly supports NOAA's objectives to improve climate predictive capability from weeks to decades, with an increased range of applicability for management and policy decisions, reduce uncertainty in climate projections through timely information on the forcing and feedbacks contributing to changes in the earth's climate, understand and predict the consequences of climate variability and change on marine ecosystems, and increase number and use of climate products and services to enhance public and private sector decision making.

Performance Goal: Climate Predictions and Projections	**With increase**	**Without Increase**
CCSP Deliverable: Research for Earth System Model - Integrate Carbon Cycle into Earth System Model	Q1 FY07	Q3 FY07
CCSP Deliverable: Complete CCSP S&A report on updated greenhouse gas scenarios	Q4 FY07	Q2 FY08

OUTYEAR FUNDING ESTIMATES
(BA in thousands)

Research Supercomputing/ CCRI	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to complete*	Total
Change from FY 2007 Base		984	984	984	984	984	-	
Total Request	10,484	10,379	10,379	10,379	10,379	10,379	-	Recurring

*Outyear costs are estimates and are subject to change. Future requests will be determined through the annual budget process.

National Weather Service
Activity: Systems Acquisition

GOAL STATEMENT:

See the Overview for the National Weather Service Operations, Research, and Facilities for a discussion of our goals.

BASE DESCRIPTION:

Automated Surface Observing System (ASOS): This acquisition is a tri-agency program involving NOAA, the Department of Defense, and the Federal Aviation Administration. ASOS provides reliable, 24-hour, continuous surface weather observations. Under the product improvement portion of this acquisition program, NOAA is developing new ASOS sensor capabilities in order to meet changing user requirements and decrease maintenance demands.

FY 2004 Accomplishments:
- Deployed 52 processors, bringing total deployed to 262 of 311
- Deployed 142 dew point sensors, bringing total deployed to 197 of 311
- Deployed 182 all-weather precipitation accumulation gauges, bringing total deployed to 198 of 331
- Acquired 40 ice free wind sensors
- Continued development of enhanced precipitation identifier sensor

FY 2005 Accomplishments:
- Completed processor (49) and dew point sensor (114) deployment of 311 units each
- Completed all-weather precipitation accumulation gauge deployment of 331 units
- Acquired 269 ice free wind sensors and began deployment
- Continued development of enhanced precipitation identifier sensor and down selected from two vendors to one
- Acquired and initiated evaluation of 25,000 ft and 40,000 ft. COTS ceilometers

FY 2006 Plans
- Complete ice free wind sensor deployment of 310 units
- Complete development and procure 282 enhanced precipitation identifier sensors
- Initiate development and system integration of 25,000 ft and/or 40,000 ft. ceilometers

FY 2007 Plans

- Complete enhanced precipitation identifier sensor deployment.
- Complete development of and begin production of 25,000 ft. and 40,000 ft. ceilometers

OUTYEAR FUNDING ESTIMATES
(BA in thousands)

ASOS Product Improvement	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to complete*	Total
Change from FY 2007 Base		(700)	(700)	(4,635)	(4,635)	(4,635)	-	
Total Request	44,444	3,935	3,935	-	-	-	-	52,314

* Outyear costs are estimates and subject to change. Future requests will be determined through the annual budget process.

Advanced Weather Interactive Processing System (AWIPS)/NOAAPort: AWIPS is the cornerstone of the modernized NWS. This system integrates and displays all hydrometeorological data at NWS field offices. AWIPS acquires and processes data from modernized sensors and local sources, provides computational and display functions at operational sites, provides robust communications system to interconnect NWS operational sites, and disseminates warnings and forecasts in a rapid, highly reliable manner. This system integrates satellite, NEXRAD Doppler weather radar data, and numerical weather prediction data enabling field forecasters to better visualize environmental processes to enable the creation of timely and accurate forecasts and warnings. AWIPS provides the only display for NEXRAD Doppler weather radar data at NWS Weather Forecast Offices (WFOs) and River Forecast Centers (RFCs). The AWIPS NOAAPort satellite broadcast network offers the communications capability to provide internal and external users with open access to much of NOAA's real-time environmental data.

Pre-planned and ongoing NOAA investments in modeling, satellite instruments, and radar improvements (NEXRAD Product Improvement) represent NOAA's commitment to bring forecasters the data and information required to improve forecast accuracy and warning lead times. NWS Government Performance and Results Act goals are based on the effective use of these technology investments along with advanced decision assistance tools, forecast preparation and advanced database capabilities. Sustained investments in the AWIPS hardware, communications, and software infrastructure, are necessary for capitalization of these investments into improved performance.

System-wide information technology (IT) investments are necessary to equip NWS forecast offices with the necessary computer performance and capacity to achieve planned and evolving operational and strategic requirements. Planned improvements in the NWS Tornado Warning Lead Time, Flash Flood Warning Lead Time and Winter Storm Warning Lead Time goals can only be realized through the following actions: improve AWIPS system throughput; add new and improved science; and exploit more accurate and higher resolution data and weather forecast model information.

To accomplish this, we must improve AWIPS system's performance and capacity. Current choke points in system performance and capacity have been identified and are being addressed in the following areas: server performance, network throughput, and software architecture.

Improvements in system throughput can be realized by increasing processing and network capacity. Exploitation of new science requires radar, satellite and model data in addition to processing capacity and the ability to quickly and cost-effectively integrate improved decision assistance tools into the AWIPS software. High-resolution data and model information requires additional communications bandwidth, processing and mass storage capacity.

To measure current and projected AWIPS system performance the Workstation Performance Rating (WPR) has been developed. The WPR shows the latency, or inherent processing delay, in seconds within the AWIPS system. A higher WPR means more latency, and therefore more delay, in processing and in getting forecasters the products they need when they need them. WPR benchmark analysis has shown that, without planned hardware improvements supported within this funding level, AWIPS performance will continue to decrease, resulting in an estimated 4-minute degradation in Tornado Lead Time by FY 2009.

In FY 2002, the NWS began a migration of the AWIPS IT infrastructure to a LINUX-based architecture. Phase I of this migration was completed in FY 2003. LINUX Phase II began in FY 2003 with workstation replacements and will be completed in FY 2006. In FY 2006 LINUX Phase II continues with server replacements, software re-architecture, IT security enhancements, and local area network enhancements.

AWIPS has been designated an NWS "National Critical" IT system. As such it was required to be certified and accredited using the National Information Assurance Certification and Accreditation Process (NIACAP) in FY 2004. System acquisition funds provided in this PAC program are critical to providing adequate security for this National Critical system.

Outcomes:

The following table provides a summary of current hardware and communications performance measures and increases due to the investments described here. As noted previously, an increase in processing and communications capacity is essential in meeting the continuing, more stringent GPRA measures.

Performance Measure	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Processing Capacity (MFLOP)	7500	7500	7500	7500	16000
Benchmark Processing Speed (WPR-sec)	163	155	147	140	133
Effective Bandwidth Capacity (Mbps)	6.9	9.2	9.2	45	45

FY 2005 Accomplishments:

- Complete second phase of satellite broadcast network (SBN) bandwidth enhancements
- Continued LINUX phase 2 system upgrades including server replacements, satellite communications enhancements, IT security enhancements, and router replacement
- Continued software development and maintenance including porting to LINUX and warning decision support assistance
- Completed replacement of 800 Text workstations (X-windows terminals) at 167 sites
- Completed deployment of replacement for aging Hewlett Packard Data Servers (DS) with high performance Linux cluster (DX) coupled with a Network Attached Storage (NAS) unit. The DS replacement package is known as the DX/NAS.
- Completed replacement of AWIPS routers and firewalls to ensure system security and maintainability
- Continue development of AWIPS Linux Prototype System (ALPS)

FY 2006 Plans:

- Decommission old satellite broadcast network (SBN) demodulators
- Continue software development and maintenance including porting to LINUX and warning decision support assistance
- Complete LINUX phase 2 system upgrades
- Decommission older HP application servers
- Begin the AWIPS software re-architecture effort
- Replace aging AWIPS printers, and Simpact X.25 interfaces
- Begin Continuous Technology Refresh (CTR) effort to replace aging LDAD Servers with redundant Linux servers
- Add two new compute nodes to the DX/NAS Linux compete cluster

FY 2007 Plans:

- Replace aging Communications Processors
- Begin phase three of satellite broadcast network (SBN) bandwidth enhancement to 45 Mbps
- Continuous Technology Refresh (CTR) for 800 AWIPS workstations, Pre-Processors, and Text workstations
- Continue AWIPS software re-architecture efforts
- Replace aging Pre-Processor server clusters at 167 sites

OUTYEAR FUNDING ESTIMATES (BA in thousands)								
AWIPS Product Improvement	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to complete*	Total
Change from FY 2007 Base	-	-	-	-	-	-	-	
Total Request	90,375	12,764	12,764	12,764	12,764	12,764	-	154,195

* Outyear costs are estimates and subject to change. Future requests will be determined through the annual budget process.

Next Generation Weather Radar (NEXRAD): NEXRAD is a Doppler weather radar system that provides automated signal processing, computerized processing of data by sophisticated meteorological software algorithms, and a high-capacity, processor-driven communications capability. The system is modular in design, upgradeable, has a long life-cycle expectancy, and provides both governmental and commercial sector weather users with a wide array of automated weather information that will increase their capability to meet their respective operational requirements. For the NWS, the system uses Doppler technology and hydrometeorological processing to provide significant increases, both in the functional capability and in performance, compared with previous radars, including improved tornado and thunderstorm warnings, increased air safety, improved flash flood warnings, and improved water resources management.

Representation of clouds, precipitation, and storm-related winds is critical for improved mesoscale forecasts of severe weather. The NEXRAD network provides winds and radar reflectivity data, which can be used on 10 km and smaller scales. NCEP will implement an initial use of NEXRAD winds in 2003, but much more work is necessary to use the reflectivity for initial conditions and improve the use of wind and precipitation observations in numerical weather prediction. Using NEXRAD data in this way will improve the capability of new high-resolution data assimilation and modeling systems to forecast severe weather on hourly time scales for NWS WFO support.

Funding for NEXRAD includes Implementation of Open systems Radar Data Acquisition (ORDA) to enable the NWS to improve tornado warning lead times from 11 minutes to 15 minutes by 2008 and save $2.4M in FY 2006 from the total cost of the NEXRAD Product Improvement Program. The ORDA systems will enable improvement in the spatial resolution (termed Super Resolution) of the radar data. Super Resolution will double the potential range of detection of parent circulations of small tornadoes from 120km to 240km, an increase in coverage area for such circulations by 80%. When fully implemented (by FY 2010), Dual Polarization technology will enable NWS forecasters to provide better flash flood warnings, better short term advisories for hazardous winter storms, information on aircraft icing potential, and better severe hailstorm warnings. Dual Polarization will also improve NEXRAD precipitation and wind estimates by identifying and removing non-weather targets such as birds from the data. These data quality improvements will enhance the value of the NEXRAD data to high resolution data assimilation and modeling systems. Improvements to data assimilation and modeling systems using NEXRAD data will result in the improvement of day one precipitation forecast accuracy to 29% by FY 2008, tornado lead time to 15 minutes in FY 2008, and flash flood lead time to 49 minutes in FY 2008.

FY 2004 Accomplishments:
- Completed development of ORDA
- Began full scale development of dual polarization technology

FY 2005 Accomplishments:
- Completed ORDA testing
- Continued development and validation of dual polarization technology

FY 2006 Plans:
- Deploy 100 ORDA Units
- Complete requirements and functional analysis for dual polarization capability; award development and production contract

FY 2007 Plans:
- Complete ORDA Deployment (total 120 operational units)
- Begin full scale development of Dual Polarization

OUTYEAR FUNDING ESTIMATES
(BA in thousands)

NEXRAD	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to complete*	Total
Change from FY 2007 Base		-	-	-	(8,376)	(8,376)	-	
Total Request	70,368	8,376	8,376	8,376	-	-	-	95,496

* Outyear costs are estimates and subject to change. Future requests will be determined through the annual budget process.

Radiosonde Replacement Program: The NWS radiosonde network provides upper-air weather observations; the primary source of data required by NWS numerical weather prediction models, which form the basis of all NWS forecasts for day 2 and beyond. Observations of temperature, pressure, humidity, and wind speed/direction are taken twice a day at 102 locations nationwide and in the Caribbean using a balloon-borne instrument (radiosonde) which transmits the data via radio signal to a ground receiving station usually located at a Weather Forecast Office (WFO), where it is processed.

New frequency allocations require reduction in bandwidth on the frequencies used to transmit data from the radiosonde to the ground receiving station and prevent interference to the ground station receiver. Reallocation of frequency spectrum in 1999 has placed the radiosondes at risk of losing data, due to interference from new band users, and may force radiosondes to use frequencies that will increase interference with meteorological satellite operations. Both the radiosondes and the ground receiving equipment must be replaced by the NWS in order to comply with the new spectrum allocation. In addition, the ground receiving station processors are IBM XTs and cannot support the Windows-based software required to manage the Global Positioning System (GPS) radiosonde data. Finally, new surface observing instrumentation is necessary to comply with surface launch accuracy reporting requirement.

In FY 2007, the base program will fund 78 of the 102 sites and reduce the number of radiosondes and sites installed.

FY 2004 Accomplishments
- Awarded full-rate production contract for GPS radiosonde
- Completed system testing
- Completed deployment of surface observing system
- Began testing of pre-production prototypes from second GPS radiosonde supplier

FY 2005 Accomplishments
- Completed operational testing
- Deployed 5 RRS systems for a total of 15
- Continued testing of pre-production prototypes from second GPS radiosonde supplier

FY 2006 Plans
- Deploy 12 RRS systems for a total of 27
- Continued testing of pre-production prototypes from second GPS radiosonde supplier

FY 2007 Plans
- Deploy 18 RRS systems for a total of 45
- Award limited low-rate production contract for second radiosonde supplier.

NOAA's Environmental Real Time Observation Network (NERON) (Formerly known as Cooperative Observer Network Modernization (COOP-M)): NERON will provide the United States with a network of accurate, real-time surface weather data (temperature and precipitation at a minimum) obtained with state-of-the-art measurement, monitoring, and communication equipment. Quality controlled, higher density, real-time surface data will preserve and enhance the climate record of the Nation and improve temperature forecast skill, river height forecast error, radar estimates of precipitation, drought monitoring resolution, hydrology planning, and energy optimization for NWS customers.

A specific goal of NERON is to form the infrastructure for the National Integrated Drought Information System (NIDIS). Additional sensors from proven commercial off-the-shelf technology, including wind data, can provide timely data for response to homeland security events or disasters. Benefits and outcomes are summarized in the table below. The objective of NERON, completing the program started in FY 2003, is to deploy or upgrade up to 8,000 modernized sites.

The modernized NERON instrument suite will include sensors to measure temperature, precipitation, and eventually snow depth. In the near term, electronic methods will be available for augmentation of snowfall and depth information. In addition, the instrument suite can be upgraded to include surface wind measurement in support of Homeland Security and to measure the density of particles less than 2.5 microns in diameter for both EPA air quality and Homeland Security. Each instrument suite will include the communications necessary to transmit observations in real time to a central location from which the data can be monitored, quality controlled and disseminated.

A part of NERON is the Historical Climate Network (HCN), comprised of approximately 1200 stations. Because of its unique purpose as the long-term network developed to assist in the detection of regional climate change, it is a high priority of NWS to ensure the integrity of its long-term database. Like other manual NERON sites, the HCN uses older technology, and the data are not available in real time. Real time observations are necessary to meet users' needs and to provide sensor information for prompt maintenance actions. The modernization of HCN sites will mitigate the lack of information from geographical sub-regions and provide, in real-time, very high quality surface observations of temperature and precipitation that meets climate, hydrology, and weather and water forecasting needs. Modernizing HCN will reduce the uncertainty in the measure of regional climate change.

In FY 2003 and FY 2004, a low-cost, standardized, climate/weather observing system supporting multi-agency federal requirements and requirements of all climate and weather data users was developed and deployed at specified sites and used as a proof of concept and risk reduction. The goal is to develop a network of 8000 modernized systems. Actions include:

- Modernizing temperature and precipitation gauges at locations identified by Regional Site Selection Teams with a clear focus on NIDIS activities
- Adding automated data communication, dissemination, & archiving at these sites**:**
  Temperature and precipitation data reported in real time
  Snowfall data reported daily
- Improving spatial distribution (increased density in the Western United States & Alaska)
- Rigorous quality assurance of network data that are made available in real time through a distributed network of mirrored servers validated by professional staff at an operational central monitoring facility
- Disseminating all data via the Advance Weather Information Processing System (AWIPS), internet and by other means

FY 2002: 118 temperature demonstration sites were deployed.
FY 2003/2004: Prototypes designed and 4 prototypes were installed, and 100 modernized stations acquired.
FY 2005: 100 fully modernized sites deployed in the Northeast; (includes upgrade at 40 of the temperature demonstration sites); Operated and maintained modernized COOP stations; add public/private mesonet partnerships, perform risk reduction of data monitoring and processing system.
FY 2006: Modernize 20 COOP stations in North East and 30 in the west in support of NIDIS for a total of 150.
FY 2007: Maintain all stations modernized between FY 2003 and FY 2006. Continue to monitor and process data. Install 58 NIDIS sites in West and NE for a total of 480 stations. $500K will be used to modernize 20 HCN sites, including site selection, acquiring and installing the hardware and fences, establishing real time communications, and maintaining the new HCN stations.

Each modernized NERON site will automatically collect and disseminate data for temperature and precipitation. Selected stations will be expanded to also collect soil moisture and wind data. The potential will exist to collect other data as well. These data will be transmitted in real time via the National Law Enforcement Telecommunications System and other communications technology to a central processor from which the data will be disseminated to Weather Forecast Offices, (WFOs), NOAA's National Climate Data Center (NCDC), and other users. Data will also be available on the Internet. Data will be temporarily archived at each site and at the central processor and for the long term at NCDC.
Real time data will be used in computer models to enhance short-term temperature forecast accuracy and will be used in tandem with information from weather radar to improve flood and flash flood forecasts.

OUTYEAR FUNDING ESTIMATES
(BA in thousands)

COOP Modernization/ NERON/ HCN/ Surface Wx	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to complete*	Total
Change from FY 2007 Base	-	-	-	-	-	-		
Total Request	5,082	4,234	4,234	4,234	4,234	4,234	21,170	47,422

*Outyear costs are estimates and are subject to change. Future requests will be determined through the annual budget process.

NWS Telecommunications Gateway Legacy Replacement: The NWSTG is the NWS communications hub for collecting and distributing weather information to its field units and external users. Replacing the NWSTG system with up-to-date technology will reduce the current delays in collecting and disseminating data by reducing transit time through the NWSTG. The replacement will ensure reliable delivery of NWS products to users and will fully capitalize on better observation data and prediction models to improve services. In FY 2006, NWS will conclude a three-year effort to replace the National Weather Service Telecommunications Gateway (NWSTG) switching system and repair and upgrade NWSTG facilities.

FY 2004 Accomplishments:

- Post Request for Information (RFI) for replacement solutions
- Acquired communications matrix switch
- Acquired Front End Processors (FEP) servers
- Acquired redundant Uninterrupted Power Supply (UPS)
- Modified cooling system
- Corrected electrical system deficiencies

FY 2005 Accomplishments:

- Acquired enterprise servers and FEP
- Acquired enterprise file system
- Continued facility upgrade activities
- Designed and implemented new internal network
- Initiated transition from dedicated point-to-point based wide area network to IP network architecture

FY 2006 Plans:

- Build and test enterprise servers and file system
- Continue facility upgrade activities
- Implement NWSTG legacy replacement system
- Acquire NWS Back-up Telecommunications Gateway (BTG) network infrastructure
- Begin NWS BTG systems testing
- Begin NWS BTG network failover testing

FY 2007 Plans:

Execute limited technical refresh in 2nd Quarter
Implement NWS BTG infrastructure

OUTYEAR FUNDING ESTIMATES (BA in Thousands)								
	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to Complete*	Total Program Estimate
NWSTG Legacy Replacement								
Change from FY 2007 Base		-	-	-	(495)	(495)	-	
Total Request	5,800	495	495	495	-	-	-	7,285

*Outyear costs are estimates and subject to change. Future requests will be determined through the annual budget process.

Weather and Climate Supercomputing: The cyclical upgrade of the NWS weather and climate supercomputing capability is intended to procure the computing and communications equipment needed to receive and process the increasing wealth of environmental data acquired by modernized observing systems, process improved and more sophisticated numerical weather prediction models, and stay current with the supercomputing technology the market has to offer. Execution of this program promotes public safety and the protection of property by providing the NCEP with the computer systems that are capable of producing more accurate NWS climate and numerical weather prediction (NWP) guidance products for hurricanes, severe thunderstorms, floods, and winter storms. Additionally, the supercomputing system more accurately forecasts large-scale weather patterns in the medium (3 to 10 days) and extended range (30 days), plus forecasts of major climate events such as El Niño and La Niña. In addition, the computer upgrades will improve the delivery of products to the field and provide system users with enhanced productivity. These products and services will lead to significant economic benefits for users, like the agriculture, construction, and transportation industries.

FY 2003 Accomplishments:

- Transitioned Class VIII computer operations to the new Central Computer System (CCS)
- Began operational use of the new CCS beginning in June
- Added "on-call" 4 per day run to support fire weather services using 8km Non-hydrostatic Mesoscale Model
- Implemented the following NWP model improvements:
- 55Km resolution Global Forecast System from 75 Km (medium range and aviation forecasting).
- Upgraded physics into operational GFDL hurricane forecast model
- Enhancements to mesoscale Eta analysis and model physics

- FY 2004 Accomplishments:
- Delivered and installed upgraded Central Computer System (CCS)
- Delivered and installed backup computer
- Implemented the following NWP model improvements:
- Expand vessel icing products model to a global domain
- Expand Wavewatch III wave model runs from 168 hours to 180 hours
- Implement downscaled GFS with Eta Extension (DGEX) (extends the information content of medium range model prediction fields to finer scales for use with Interactive Forecast Preparation System (IFPS)
- Extend 105 km resolution of Global Ensemble Forecast system from 84 to 180 hours, increase runs from two to four times daily
- Implement CDC ensemble week-2 forecast system into operational suite
- Implement new Climate Forecast System
- Earlier delivery of mesoscale Eta model forecasts
- Implemented one-day air quality forecast for NE U.S.
- Implemented two member WRF ensemble
- Enhanced mesoscale Eta analysis and model physics

- FY 2005 Accomplishments:
- Completed Central Computer System Upgrade
- Completed implementation of Central Computer System Backup
- Implemented Global Forecast System with increased horizontal resolution: 35 km out to 7.5 days (currently 55 km) and 70 km to 16 days (currently 105km)
- Added assimilation of AIRS (Atmospheric Infrared Sounder) data to Global Forecast System
- Implemented Rapid Update Cycle: 13 km (currently 20 km)
- Implemented Global Ensemble upgrade of resolution (from 210 km to 105 km for forecast hours 180 – 384)
- Provided Short Range Ensemble Forecast output for Alaska and Hawaii
- Implemented WRF with two dynamic cores at ~5 km resolution in Nested Window run
- Implemented Climate Forecast System Ensemble Runs (2 members/day)
- Began experimental production of expanded air quality guidance over Eastern U.S.
- Enhanced North American Ensemble Forecast System by merging ensembles from U.S. and Canada
- Added six new members to Short Range Ensemble Forecast (SREF) system

- FY 2006 Plans:
- Replace model in North American run (currently 12 km Eta) with 10 km WRF Non-Hydrostatic Mesoscale Model
- Provide assessment of WRF-based Hurricane model
- Run experimental North American Land Surface Data Assimilation System
- Implement HYCOM-Based Real-Time Ocean Forecast System for the North Atlantic Basin
- Complete implementation of six WRF members into the Short Range Ensemble Forecast System
- Implement operational production of expanded air quality forecast guidance over the eastern U.S. with WRF
- Implement increased satellite observations into global data assimilation system (including AIRS data upgrade, NOAA-18 data and MODIS data)

- FY2007 Plans:
- 13 Km WRF capability in Hurricane model
- Replace RUC with WRF-based rapid refresh model
- Enhancements to Global Forecast System analysis and model physics
- Implement Basin-scale and Global Ocean Forecast system for NE Pacific and Hawaii

Base activities support the objective, "Advance understanding and predict changes in the Earth's environment to meet America's economic, social, and environmental needs" under the Department of Commerce strategic goal of "Observe, protect, and manage the Earth's resources to promote environmental needs."

OUTYEAR FUNDING ESTIMATES
(BA in Thousands)

	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to Complete*	Total Program Estimate
Weather & Climate Supercomputing								
Change from FY 2007 Base		-	-	-	-	-	-	
Total Request	130,109	19,092	19,092	19,092	19,092	19,092	95,460	321,029

* Outyear costs are estimates and subject to change. Future requests will be determined through the annual budget process.

OUTYEAR FUNDING ESTIMATES (BA in Thousands)								
	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to Complete*	Total Program Estimate
Weather & Climate Supercomputing Backup								
Change from FY 2007 Base		-	-	-	-	-	-	
Total Request	21,168	7,077	7,077	7,077	7,077	7,077	35,385	91,938

* Outyear costs are estimates and subject to change. Future requests will be determined through the annual budget process.

Complete and Sustain NOAA Weather Radio (NWR): Procure all of the transmitters for the seventeen (17) sites identified as high risk of severe weather events and begin installations. Nine (9) transmitters are planned to be installed in FY 2006 and the remaining eight (8) in FY 2007. Additionally, funds will be used to begin the refurbishment of four hundred (400) stations established in the 1970s, eliminating single points of failure and improving network reliability.

NWR was designed to be and is used as a reliable, inexpensive means of communicating weather related warnings to the public. The existing infrastructure of NWR has tremendous potential for use communicating warnings and information about non-weather related hazards and emergencies. NOAA has had extensive meetings with the Department of Homeland Security, discussing the use of NWR as an all hazards warning system. National Weather Service received an appropriation of $5.4M in FY 2004 to make NWR an all hazard warning network. NWR infrastructure as a national warning network consists of over 900 existing broadcast stations; broadcast coverage that reaches 97% of the nation's population; and the ability to deliver the broadcasted message to individuals monitoring their own NWR receivers as well as the ability to reach millions of listeners and viewers since NWR signal enters the Emergency Alert System, which is monitored by television and radio license holders.

NOAA categorizes 248 areas in the United States as being at high risk of experiencing severe weather. Severe weather includes tornados, hurricanes, flash floods, flooding, severe winter weather and severe marine weather. NOAA defines high-risk areas as areas that score above 225 points using NOAA Weather Radio Priority Weighted Value (PWV) system as defined in the *NOAA Weather Radio Prioritized Plan for Areas Lacking Coverage* dated February 2001. Points are accumulated based on the number of severe weather events, as documented in the NWS Weather Incident Report, and weather related fatalities over the past ten years. Additionally, population statistics for the areas are identified. The NWR Program Office reassesses the identification of high-risk areas annually. To achieve 100% coverage of high-risk areas, seventeen (17) additional NWR broadcast stations are needed.

In its efforts to sustain a high level of reliability and maintainability of NOAA Weather Radio, National Weather Service faces challenges due to equipment obsolescence and due to degraded reliability relative to that possible with newer technology equipment. Four hundred (400) NWR station transmitters are

of 1970's vintage, employing vacuum tube technology from four different manufacturers. These older stations are less reliable than newer ones using solid-state transmitters. Older stations demonstrate mean time between failure (MTBF) rates of 6,000 hours, or one failure every 250 days. In comparison, newer solid-state transmitters demonstrate MTBF of over 10,000 hours, a 67% improvement. Furthermore, stations have single points of failure due to configurations that include single, instead of dual, transmitters and lack of backup power generators to ensure continued service in the event of primary electrical service failure. Combined, these factors significantly decrease reliability and availability and increase logistics and maintenance costs. Refurbishing these older stations and adequately funding operations and maintenance costs will allow NWR to meet expectations of availability as the nation's weather and all hazard warning system.

FY06 Plans
Procure transmitters for the 17 high risk areas.
Establish 9 new sites in high risk areas
Refurbish 64 of the 400 older sites.
Provide operations and maintenance of the NWR network for gifted and other transmitters.

FY07 Plans
Establish 8 new sites to complete the network coverage in high risk areas.
Refurbish an additional 78 of the 400 older sites for a total of 145.
Provide operations and maintenance for gifted and other transmitters including the 17 new sites and 64 refurbished sites.

OUTYEAR FUNDING ESTIMATES
(BA in thousands)

Complete & Sustain NWR	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to complete*	Total
Change from FY 2007 Base								
Total Request	5,572	5,594	5,594	5,594	5,594	5,594	27,970	61,512

* Outyear costs are estimates and subject to change. Future requests will be determined through the annual budget process.

Transfers
NWS requests the following transfers between line offices or appropriations.

From Line	Line	To Office	Line	Amount
Program Support	Integrated Ocean Observing System	NWS	Coastal Global Observing System	$1,492,000
Program Support	Strengthen U.S. Tsunami Warning System	NWS	Strengthen U.S. Tsunami Warning System	$3,480,000

$1,492,000 is transferred from the Program Support/Integrated Ocean Observing Systems to fund NWS Coastal Global Observing System where it has traditionally been appropriated.
$3,480,000 is transferred from the Program Support/Integrated Ocean Observing Systems to the NWS Strengthen U.S. Tsunami Warning System.
$500,000 is transferred between the NWS Cooperative Observer Network Modernization to spread funds toward the climate goal.

PROPOSED LEGISLATION:

None.

SUMMARIZED FINANCIAL DATA

(Dollars in thousands)

Procurement Acquisition and Construction	FY 2005 ACTUALS	FY 2006 CURRENTLY AVAILABLE	FY 2007 BASE PROGRAM	FY 2007 ESTIMATE	INCREASE / DECREASE
Line Item: Systems Acquisition					
ASOS	4,608	8,506	4,635	3,935	(700)
AWIPS	12,708	13,280	12,764	12,764	-
NEXRAD	10,665	9,343	8,376	8,376	-
NWSTG Legacy Replacement	2,476	493	495	495	-
Radiosonde Network Replacement	6,285	6,299	4,347	4,014	(333)
Weather and Climate Supercomputing (WW)	19,322	19,020	19,092	19,092	-
Weather and Climate Supercomputing Backup	7,045	7,050	7,077	7,077	-
Cooperative Observer Network Modernization (WW)	864	4,218	3,739	3,739	-
Cooperative Observer Network Modernization (C)	-	-	495	495	-
NWS Coastal Global Observing System	-	-	1,492	-	(1,492)
Complete and Sustain NOAA Weather Radio	-	5,572	5,594	5,594	-
Strengthen US Tsunami Warning Network	10,160	3,796	3,470	1,030	(2,440)
All Hazard National Warning Network: NOAA Weather Radio	-	1,998	-	-	-
TOTAL	74,133	79,575	71,576	66,611	(4,965)
FTE	44	54	54	54	-

Note: The dollars in this table represent budget authority.

PROGRAM CHANGES FOR FY 2007:

Automated Surface Observing System Product Improvement (0 FTE and -$700,000): NOAA requests a decrease of 0 FTE and $700,000. This decrease reflects a planned change in the implementation strategy for 240 of the total 377 sites from 40,000 foot ceilometers to 25,000 foot ceilometer.

OUTYEAR FUNDING ESTIMATES (BA in thousands)								
ASOS Product Improvement	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to complete*	Total
Change from FY 2007 Base		(700)	(700)	(4,635)	(4,635)	(4,635)	-	
Total Request	44,444	3,935	3,935	-	-	-	-	52,314

* Outyear costs are estimates and subject to change. Future requests will be determined through the annual budget process.

Radiosonde Replacement System (0 FTE and -$333,000): NOAA requests a decrease of 0 FTE and $333,000. This decrease reflects a planned extension of the deployment schedule by one year so that the network is complete in FY 2009.

OUTYEAR FUNDING ESTIMATES (BA in Thousands)								
	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to Complete*	Total Program Estimate
Radiosonde Replacement System								
Change from FY 2007 Base		(333)	(333)	(333)	(4,347)	(4,347)	-	
Total Request	49,722	4,014	4,014	4,014	-	-	-	61,764

* Outyear costs are estimates and subject to change. Future requests will be determined through the annual budget process.

Coastal Global Ocean Observing System (0 FTE and -$1,492,000): NOAA requests a decrease of 0 FTE and $1,492,000 to terminate the Coastal Global Ocean Observing System Program. This funding has been redirected to financially support other NOAA programs.

OUTYEAR FUNDING ESTIMATES (BA in thousands)								
C-GOOS	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to complete*	Total
Change from FY 2007 Base		(1,492)	(1,492)	(1,492)	(1,492)	(1,492)	-	
Total Request	1,477	-	-	-	-	-	-	1,477

* Outyear costs are estimates and subject to change. Future requests will be determined through the annual budget process.

Strengthening the U.S. Tsunami Warning Program (+0 FTE and -$2,440,000): NOAA requests a decrease of $2,440,000 to reflect the planned reduction in the procurement of program assets that were required to accelerate the development and deployment of a national tsunami warning system in FY 2005 and FY 2006. Funds will be used to complete the planned acquisition of deep ocean assessment and report of tsunamis (DART) buoys for the Pacific Ocean Basin and the Caribbean/Atlantic Ocean region. This budget request is necessary to complete the foundation laid by the Administration in FY 2005 and FY 2006 to strengthen the U.S. tsunami warning program. Lessons learned from the 2004 Indian Ocean Tsunami indicate that there are three key interlocking components of an effective Tsunami Warning/Response System: (1) Tsunami Hazard Assessment (must include comprehensive coastal US risk assessments/inundation mapping); (2) Tsunami Warning Guidance (must include 24/7 tsunami detection and warning systems and the dissemination of accurate and timely tsunami forecasts and warnings (seconds literally count)); and (3) Tsunami Mitigation (including community-based emergency response plans, public education/awareness (TsunamiReady communities and inundation/evacuation mapping)). This investment is one of the high priority investments required for NOAA's implementation of the Integrated Ocean Observing System (IOOS) as the coastal and open ocean component of the Global Earth Observing System of Systems (GEOSS). Combined with other like-identified IOOS investments across NOAA, it is part of NOAA's strategy to provide initial benefits of an integrated ocean observing system, focusing on enhancing key observational capabilities throughout NOAA, and our ability to provide customers with enhanced coastal data and information.

Statement of Need

In response to the 2004 Indian Ocean Tsunami, the Administration committed $26.7M ($17.2M in FY 2005 and $9.5M in FY 2006) to expanding the U.S. Tsunami Warning Program to protect U.S. lives and property along all coasts (Pacific, Gulf of Mexico, Atlantic and the Caribbean). In order to sustain the Administration's commitment to strengthening the U.S. Tsunami Warning Program, and mitigate a similar seismic/tsunami event in the U.S., NOAA needs to complete the procurements of the necessary assets to complete and maintain the national warning system infrastructure.

Requested funds are required to complete the planned deployment and operations of the 39 Deep-ocean Assessment and Reporting of Tsunamis (DART) buoy systems, strategically sited along the Pacific, Atlantic and Caribbean basins, to accurately detect and measure tsunamis and provide advance warnings. Data from DARTs will also aid U.S. Tsunami forecasters in not only reaching tsunami warning decisions, but also in providing detailed tsunami forecasts (inundation locations, wave heights, number of waves).

Proposed Actions:

In FY 2005, the tsunami warning system expansion plan called for:

- Awarding procurement contracts for and deploy first 10 DART buoys (PAC)
- Procuring and install/upgrade new sea level monitoring/tide gauge stations in the Pacific and Atlantic Regions and the Caribbean (ORF)
- Begin staffing increases to provide 24/7 warning coverage at the Pacific and Alaska Tsunami Centers (ORF)
- Expanding the International Tsunami Information Center (ITIC) (ORF)
- Begin upgrading NWS-owned seismometers in Alaska and Pacific regions used to improve Local Tsunami Warning capabilities (PAC)
- Improving existing seismic detection network in the Caribbean (PAC)
- Begin expansion of the PTWC Facility for 24/7 Operations (Construction)
- Accelerating and expanding tsunami education/outreach (Tsunami Ready program) to improve community preparedness (ORF)
- Accelerating Tsunami Inundation Mapping along the West Coast and expand this program into the Caribbean/Atlantic/Gulf of Mexico (ORF)

In FY 2006, the tsunami warning system expansion plan calls for:

- Installing 16 new DART Buoys in the Pacific and Caribbean (PAC)
- Procuring 40 DART buoys including 10 spares and 3 redundant buoys for Alaska to insure continuity of operations in harsh seas off Alaska (PAC)
- Operating and maintaining 49 new/upgraded sea level monitoring/tide gauge stations (ORF)
- Completing the expansion of the PTWC facility to accommodate 24/7 Operations (PAC)
- Completing upgrade of NWS-owned seismometers used to improve tsunami detection (PAC)
- Providing 24/7 warning coverage at the Pacific and Alaska Tsunami Centers (ORF)
- Expanding Tsunami Ready program to improve community preparedness (ORF)
- Continuing Tsunami Inundation Mapping along the West Coast and for the Caribbean,/Atlantic/Gulf of Mexico (ORF)
- Expanding Tsunami Mitigation Activities through the NWS/ITIC (ORF)

In FY 2007, the total funding of $1.03M will be used for:

- Procuring and deploying the final four (4) Spare DART Buoys (including ship time) ($1.03M)

Performance Goal and Measurement Data

This increase will support the objective: "Advance understanding and predict changes in the Earth's environment to meet America's economic, social, and environmental needs" under the DOC Strategic Goal of 'Observe, protect, and manage the Earth's resources to promote environmental needs.' Specifically, this increase supports NOAA's Weather and Water strategic goal and the performance measures below.

Performance Measure	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
Tsunami False Alarm Rate								
Local	75%	75%	75%	75%	75%	75%	75%	75%
Distant	75%	75%	75%	50%	40%	25%	25%	25%
with Adjustment								
Tsunami False Alarm Rate								
Local	75%	75%	75%	75%	75%	75%	75%	75%
Distant	75%	75%	75%	75%	75%	75%	75%	75%
without Adjustment								
Tsunami Warning Lead Time * (minutes)								
Local Tsunamis	15	10	8	6	5	5	5	5
Distant Tsunamis	30	30	30	20	15	15	15	15
with Adjustment								
Tsunami Warning Lead Time * (minutes)								
Local Tsunamis	15	10	8	8	8	8	8	8
Distant Tsunamis	30	30	30	30	30	30	30	30
without Adjustment								

*Tsunami Warning Lead Time measures the amount of time between when a seismic event occurs and when the tsunami warning is issued.

OUTYEAR FUNDING ESTIMATES
(BA in thousands)

Strengthening the U.S. Tsunami Warning Program	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to complete	Total
Change from FY 2007 Base		(2,440)	(3,470)	(3,470)	(3,470)	(3,470)		
Total Request	3,432	1,030	-	-	-	-	-	4,462

TERMINATIONS FOR FY 2007: The following programs, or portions thereof, are terminated in FY 2007: Automated Surface Observing System (Hurricane Supplemental – $3,900,000); Advanced Weather Interactive Processing System ($571,000); Next Generation Weather Radar (Hurricane Supplemental - $1,000,000); Radiosonde Network Replacement ($1,972,000); All Hazard National Warning Network: NOAA Weather Radio (Hurricane Supplemental - $2,000,000); and Strengthen U.S. Tsunami Warning Network ($3,800,000).

National Environmental Satellite, Data, and Information Service
Activity: Systems Acquisition

GOAL STATEMENT:

The goals of the Geostationary Operational Environmental Satellite (GOES) program are to continue the procurement of spacecraft, instruments, launch services, and ground systems equipment necessary to maintain an uninterrupted flow of environmental data to users.

The GOES series of satellites fall under NOAA's Mission Support goal, and support NOAA's other strategic goals to protect, restore, and manage the use of coastal and ocean resources through ecosystem-based management approaches; to understand climate variability and change to enhance society's ability to plan and respond; to serve society's needs for weather and water information; and to support the Nation's commerce with information for safe and efficient transportation (e.g., commercial aviation, utilities, commercial shipping, etc).

GOES data provides:

- Cloud images and precipitation estimates for hurricanes and other coastal storms;
- NOAA Coast Watch sea surface temperature (SST) products for locating commercial and sport fish as well as protected marine species;
- New research products, such as ocean surface currents, that support both ecosystems management and safety of marine navigation;
- Primary information in the Nation's Climate Reference Network, providing reference quality data for surface temperature and precipitation monitoring;
- Images of the United States and adjacent ocean areas to enable the detection of hurricanes and other major weather events;
- Data collection from remote fixed observing platforms such as buoys and rain gauges for use in numerical weather prediction models and flood/drought assessments;
- Weather information to emergency managers for use in times of severe weather and during other disasters;
- A means to obtain quantitative environmental data such as temperature, moisture, wind, radiation and solar energy particle flux for use in weather predictions, hydometrological flux, climate long term trending, ecosystems management, commercial economic gain, and transportation safety; and
- Unique monitoring capabilities that support air, land, and marine transportation.

The NOAA family of polar satellites (i.e., Polar-orbiting Operational Environmental Satellites (POES), and National Polar-orbiting Operational Environmental Operating Satellites System (NPOESS)), instruments, and processing systems are also Mission Support programs, and provide support for all of the other strategic plan goals, and NOAA's cross-cutting priorities.

Polar satellites provide a continuous flow of global environmental observations in support of operational requirements for:

- Environmental monitoring, and weather and marine forecasting;
- Climate assessment and change prediction;

- Detecting weather systems and significant environmental events such as volcanic eruptions, oil spills, and wildfires;
- Measuring atmospheric ozone and the space environment;
- Collecting environmental data from other surface platforms such as buoys; and
- Performing search and rescue functions.

BASE DESCRIPTION:

Geostationary Operational Environmental Satellite (GOES): The GOES system provides an uninterrupted, continuous flow of data and information that meets customers' spatial, temporal and accuracy requirements, providing significant customer benefit within an established life cycle cost target. The procurement of GOES satellites is a cooperative venture between NOAA and the National Aeronautics and Space Administration (NASA). NOAA defines requirements, manages, funds, implements system integration, procures ground segments and operates the GOES satellites. NASA serves as the agency with multi-disciplinary engineering expertise, develops detailed system specifications, procures and launches the spacecraft, and assists NOAA in system integration. For the GOES-R series the roles and the responsibilities of NOAA and NASA are being re-examined and possibly realigned to better meet each agency's charter and strategic goals.

NOAA GOES satellite systems are designed, developed, acquired and operated as a single end-to-end system. The system includes the observing platform (satellites); command and control of the platform; product generation and distribution; archive and access; and user interface. GOES contributes to an Integrated Global Observation System; is defined as an end-to-end approach linking requirements to services; delivers critical real-time data and information needed for sound decision making; addresses needs to support expanded climate services; and works with global partners.

GOES observations allow continuous monitoring from the same angle during the tracking/detection of severe storms, atmospheric moisture deltas, mesoscale scanning, currents flow dynamics, and atmospheric chemical (particle) that cannot be achieved from a non-stationary orbit without increased error rates and lost data segments. NOAA maintains an on-orbit spare to complement the two operational GOES satellites. This on-orbit spare philosophy allows NOAA to quickly replace a failed satellite by re-positioning an on-orbit satellite. To facilitate this strategy, NOAA plans the launch of the next satellite to coincide with the planned switchover of the on-orbit spare to operational status.

GOES-I SERIES: Fiscal Year 2006 is the last year of funding for on-orbit support.

GOES-N SERIES: The NOAA GOES program includes the development, procurement, and launch of the next series of GOES satellites, the GOES-N series. The spacecraft contract for the GOES–N series is a firm fixed price contract with delivery on-orbit. The GOES-N series program also includes separate contracts for the instruments, one for the Imager and Sounder, and one for the Solar X-ray Imager.

GOES-R SERIES: The GOES-R program will complete architecture studies, technology development, design, fabrication, integration and testing, and end-to-end system integration to support an initial GOES-R launch date of September 2012. End-to-end system integration refers to the acquisition of an on-orbit satellite including the spacecraft, instruments, GOES unique communications services, and launch services; the command, control, and communications and product generation and distribution functions currently performed by Satellite Services; the archive and access of all data and products; and the user interface function providing data to critical users and forecasters. A single prime contract is being contemplated to acquire the GOES-R end-to-end system. The archive and access function will be provided by NOAA's CLASS system. This end-to-end integration requires the acquisition, deployment, maintenance, and operations of the space and launch segments from FY 2012 through FY 2029.

Polar-orbiting Operational Environmental Satellite System: Currently, the polar satellite program consists of NOAA's Polar-orbiting Operational Environmental Satellites (POES) and the National Polar-orbiting Operational Environmental Satellite System (NPOESS). POES is NOAA's current operational polar system, with one more satellite left in the series (NOAA N'). NPOESS is an acquisition program that is the follow-on program mandated by Presidential directive to replace POES and the Department of Defense's (DOD) Meteorological Satellite Program (DMSP). NPOESS Data Exploitation (NDE) is a polar-related project that is still in development, planning, and acquisition.

Polar-orbiting Environmental Satellite (POES). The POES system provides daily global observations of weather patterns and environmental measurements of the Earth's atmosphere, its surface and cloud cover, and the proton and electron flux at satellite altitude; and to establish long-term data sets for climate monitoring and assessment and climate change predictions. Since the beginning of the POES program, environmental data and products acquired by its satellites have been provided to users around the globe.

In September 2003, the POES spacecraft, NOAA-N', was damaged while under construction. The incident occurred while a NASA contractor was performing an operation that required a rotation of the satellite in its construction platform. NOAA has worked out an agreement with the contractor to rebuild the satellite in order to meet the planned FY 2008 launch.

National Polar-orbiting Operational Environmental Satellite System (NPOESS): In 1994, the decision was made to integrate the Nation's civil and military polar-orbiting meteorological satellite systems into a single, national system capable of satisfying both civil and national security requirements for space-based, remotely sensed environmental data. These systems include the NOAA POES system and DOD's DMSP. As a result, NOAA, DOD, and NASA formed a tri-agency Integrated Program Office (IPO) to develop, manage, acquire, and operate the new NPOESS.

Through NPOESS, which is funded jointly by NOAA and the U.S. Air Force, the U.S. government is substantially reducing duplication of efforts by satisfying the requirements of the civil and national security communities with one system. The first result of the NPOESS program was the transfer of DMSP satellite control from the U.S. Air Force Space Command to the IPO. The command, control, and communications functions for the DMSP satellites and the POES satellites are now combined at the NOAA Satellite Operations Control Center (SOCC) in Suitland, Maryland. The launch of the DMSP F-15 satellite in December 1999 resulted in the first DMSP satellite launched and controlled by the NOAA SOCC.

NPOESS is also initiating efforts to reduce future operational risks by executing early design and fabrication of critical instruments and by leveraging instrument technology from mature satellite development programs at NASA and other agencies. Early flight demonstration of key systems will ensure that new sensors are flown in space, algorithms are tested, and that new, high volume satellite data streams can be processed and effectively utilized by both civilian and military users before the first operational NPOESS spacecraft is launched. NPOESS is a complex development program facing cost and schedule issues. We are evaluating alternatives to address these issues while maintaining continuity of polar satellite observations.

Advanced NPOESS visible, infrared, and microwave sensor suites will deliver higher resolution atmospheric, oceanic, and terrestrial data, enabling more accurate short-term weather forecasts and severe storm warnings. NPOESS also offers the added advantage of serving the longer-term data continuity requirements of the climate community for improved global climate assessment and prediction. NPOESS will provide improved measurements and information about the space environment necessary to ensure reliable operations of space-based and ground-based systems, as well as continue to provide surface data collection and search and rescue capabilities.

NPOESS Preparatory Project/NPOESS Data Exploitation: NESDIS has the mandate to operate the Nation's environmental satellites, collect environmental observations, process, distribute and archive data, and make available key data sets for both operations and research. The NPOESS Data Exploitation (NDE) component of the NPOESS Preparatory Project (NPP) consists of processing and distribution of NPOESS products and services once the data have been delivered to NOAA. NPOESS and NPP are part of a new environmental satellite program that promises to improve our observations of the earth, atmosphere, oceans and space environment. While the NPOESS contract awarded by the Integrated Program Office in August of 2002 covers the delivery of two satellites and the option to purchase four more satellites, it does not include product processing and distribution to NOAA's users and customers. In order to realize the benefits of NPOESS data, NOAA must implement capabilities to process NPOESS data records into useful products that meet the requirements of NWS and other civilian users. For example, NDE will be able to derive carbon-based products such as Methane, Carbon Dioxide and Carbon Monoxide from NPOESS observations. These gases tend to mask the atmospheric temperature and humidity observations sensed by NPOESS. By producing a better estimate of these gases, NDE will help the NWS to remove biases and improve weather forecasts. NDE will also assist the NOAA Climate Office by providing global estimates of these gases.

The FY 2007 funding will continue algorithm development begun in FY 2006, and will procure additional equipment to enhance the testing environment for these models. Funding will also be used to study archiving requirements for the NDE data.

OUTYEAR FUNDING ESTIMATES (BA in thousands)								
	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to complete*	Total
NPOESS Preparatory Project/NPOESS Data Exploitation								
Change from FY 2007 Base		-	-	-	-	-	-	
Total Request	4,455	4,455	4,455	4,455	4,455	4,455	26,730	53,460

*Outyear costs are estimates and are subject to change. Future requests will be determined through the annual budget process.

Comprehensive Large Array Data Stewardship System (CLASS): NOAA is responsible for the stewardship of over one petabyte of environmental data and information, which is expected to grow to well over 18 petabytes by 2011. NOAA spends more than one billion dollars each year collecting environmental data in support of its mission. In the near future, NOAA will launch the first NPOESS, which will provide a forty times increase in data volume per satellite. CLASS is a data archiving and access system that will improve the quality and stewardship of NOAA's environmental data and information. By providing efficient, secure, cost-effective access to NOAA's environmental data via CLASS, NOAA is supporting key research challenges identified by the U.S. Global Change Research Program, such as natural climate patterns, global monsoon, and land-atmosphere and ocean-atmosphere exchanges.

NOAA is enhancing its multiple current stovepipe archiving capabilities into a CLASS System that will be fully operational and managed at the enterprise level. This system will allow efficient management of high volumes of data critical to NOAA and the users in the scientific community. The target data originates from GOES, POES, NPP/NPOESS, DMSP, the National Weather Service's Next Generation Weather Radar and select numerical model output data. Management of these data can be accomplished only through rapidly expanding storage capacity at the Data Centers and automating the means of data ingest, quality control, and access through phased systems procurement. The early implementation of this archive and access system has paved the way to accommodate additional massive data volumes from the Earth Observing System Satellites.

Base activities support the objective, "Improve our understanding and prediction of the natural environment" under the Department of Commerce strategic goal of "Observe, protect, and manage the Earth's resources to promote environmental needs:"

OUTYEAR FUNDING ESTIMATES (BA in thousands)								
	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to complete*	Total
CLASS								
Change from FY 2007 Base		-	-	-	-	-	-	
Total Request	18,377	6,476	6,476	6,476	6,476	6,476	N/A	Recurring

* Outyear costs are estimates and subject to change. Future requests will be determined through the annual budget process.

Earth Observing System Data Archive & Access System Enhancement: NASA's Earth Observing System (EOS) data will be integrated into CLASS for archive and access. The expected large increases in data rates and volumes over the next several years from EOS data alone will far exceed the capacity and capabilities of the NOAA National Data Centers.

Base activities support both objectives under the Department of Commerce strategic goal of "Observe, protect, and manage the Earth's resources to promote environmental needs:"

OUTYEAR FUNDING ESTIMATES (BA in thousands)								
	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to complete*	Total
EOS Data Archive & Access System Enhancement								
Change from FY 2007 Base		-	-	-	-	-	-	
Total Request	8,392	990	990	990	990	990	N/A	Recurring

* Outyear costs are estimates and subject to change. Future requests will be determined through the annual budget process.

Critical Single Points of Failure: This effort supports the continuity of critical operational satellite products and services in the event of a catastrophic outage at the Suitland facility/systems and the World Weather Building in Camp Springs by providing backup capability for primary satellite products and services. The backup capability will result from NOAA's establishing a backup processing site at the Wallops Command and Data Acquisition Station in Wallops, Virginia. Prior to establishing the backup facility and turning off the Federal Building (FB4) system, it will be necessary to complete the validation and testing of the new system. The first step in this process is to ensure continuity of operations by purchasing, installing, and testing new equipment in the new NOAA Satellite Operations Facility, which is scheduled for completion in FY 2005. The Wallops facility will become the operational backup site after the new site is operational and the old equipment from FB4 in Suitland is transferred to Wallops.

Standard information technology and business principles dictate that a contingency plan for continuity of services exists in the case of a catastrophic failure. Additional communications links to connect the Wallops backup location to the NOAA Science Center in Suitland MD will also be installed.

The NOAA Product Processing and Distribution Office is a critical single point of failure for every operational NOAA satellite product and service that NWS and other users rely on for weather information. Satellite data represents more than 99 percent of the input to numerical weather prediction models. Satellite products and services include: POES products such as ozone, temperature and moisture sounder products; GOES Advanced Weather Interactive Processing System (AWIPS) remapped imagery, high density winds, precipitation estimates, sounder products; and non-NOAA satellite products from NASA, the DOD, Europe, Japan and India.

Base activities support both objectives under the Department of Commerce strategic goal of "Observe, protect, and manage the Earth's resources to promote environmental needs:"

OUTYEAR FUNDING ESTIMATES (BA in thousands)								
	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to complete*	Total
Critical Single Points of Failure								
Change from FY 2007 Base		-	-	-	-	-	-	
Total Request	8,330	2,772	2,772	2,772	2,772	2,772	N/A	Recurring

* Outyear costs are estimates and subject to change. Future requests will be determined through the annual budget process.

PROPOSED LEGISLATION:

None.

SUMMARIZED FINANCIAL DATA

(Dollars in thousands)

Procurement Acquisition and Construction	FY 2005 ACTUALS	FY 2006 CURRENTLY AVAILABLE	FY 2007 BASE PROGRAM	FY 2007 ESTIMATE	INCREASE / DECREASE
Line Item: Systems Acquisition					
Geostationary Systems	301,153	335,322	335,568	439,607	104,039
Subtotal: GOES	301,153	335,322	335,568	439,607	104,039
Polar Orbiting Systems - POES	104,230	101,261	101,767	89,906	(11,861)
Subtotal: POES	104,230	101,261	101,767	89,906	(11,861)
Polar Orbiting Systems - NPOESS	300,528	316,580	317,592	337,870	20,278
Subtotal: NPOESS	300,528	316,580	317,592	337,870	20,278
EOS & Adv. Polar Data Processing, Dist. & Archiving Systems	2,958	2,960	990	990	-
Subtotal: EOS	2,958	2,960	990	990	-
CIP - Single Point of Failure	2,760	2,798	2,772	2,772	-
Subtotal: CIP	2,760	2,798	2,772	2,772	-
Comprehensive Large Array Data Stewardship Sys (CLASS)	6,448	8,876	6,476	6,476	-
NPOESS Preparatory Data Exploitation	-	4,437	4,455	4,455	-
TOTAL	718,077	772,234	769,620	882,076	112,456
FTE	146	115	115	115	-

Note: The dollars in this table represent budget authority.

PROGRAM CHANGES FOR FY 2007:

Geostationary Operational Environmental Satellite (GOES):

GOES I-M Series (0 FTE, and -$600,000): NOAA is requesting a decrease of **$600,000** in FY 2007. FY 2006 was the last year of GOES I-M funding.

GOES-N Series (0 FTE, and -$8,803,000): NOAA is requesting a decrease of **$8,803,000** for a total of **$108,239,000** in FY 2007. The NOAA GOES program continues the development, procurement, and launch of the next series of three GOES satellites – the GOES-N series. The spacecraft contract for the GOES–N series is a firm fixed price contract. The GOES-N series program also includes separate contracts for the instruments, one for the imager and sounder and one for the Solar X-ray Imager. The instrument contractors have completed delivery of all flight model instruments.

FY 2007 GOES-N funding will be used for:
- Spacecraft/launching;
- NASA technical management
- The government program office and GOES-N contribution to NESDIS leadership
- Product development; and
- Ground systems and backup

GOES-R Series (0 FTE, and +$113,442,000): NOAA is requesting an increase of **$113,442,000** for a total request of **$335,800,000**. This request is consistent with the baseline profile for the program agreed to by the Administration in the FY 2006 President's Budget. Weather- and Climate-sensitive industries, both directly and indirectly, account for approximately $3.0 trillion of the United States gross domestic product (about one-third). Seasonal and interannual variations in climate, e.g. El Niño, led to economic impacts on the order of $25 billion for 1997-1998. Average annual damage from tornadoes, hurricanes, and floods is $11.4 billion with about 100 deaths annually. Approximately $4 billion per year is lost in economic efficiencies as a result of weather-related air traffic delays. Lightning causes between $4 and $5 billion in losses each year in the civilian sector with about 47 deaths and 303 injuries per year. The GOES-R series will minimize these losses.

FY 2007 GOES-R funding will be used for:
- Systems integration
- Instruments contracts; and
- The government program office.

Statement of Need

The GOES system provides an uninterrupted, continuous flow of data and information that meets customers' spatial, temporal and accuracy requirements, providing significant customer benefit within an established life cycle cost target. The procurement of GOES satellites is a cooperative venture between NOAA and the National Aeronautics and Space Administration (NASA). NOAA defines requirements, manages, funds, implements system integration, procures ground segments and operates the GOES satellites. NASA serves as the agency with multi-disciplinary engineering expertise, develops detailed system specifications, procures and launches the spacecraft, and assists NOAA in system integration.

NOAA GOES satellite systems are designed, developed, acquired and operated as a single end-to-end system. The system includes the observing platform (satellites); command and control of the platform; product generation and distribution; archive and access; and user interface. GOES contributes to an Integrated Global Earth Observation System (GEOSS); is defined as an end-to-end approach linking requirements to services; delivers critical real-time data and information needed for sound decision making; addresses needs to support expanded climate services; and works with global partners.

GOES observations allow continuous monitoring from the same angle during the tracking/detection of severe storms, atmospheric moisture deltas, mesoscale scanning, currents flow dynamics, and atmospheric chemical (particle) that cannot be achieved from a non-stationary orbit without increased error rates and lost data segments. NOAA maintains an on-orbit spare to complement the two operational GOES satellites. This on-orbit spare philosophy allows NOAA to quickly replace a failed satellite by re-positioning an on-orbit satellite. To facilitate this strategy, NOAA plans the launch of the next satellite to coincide with the planned switchover of the on-orbit spare to operational status.

Proposed Actions

Requested FY 2007 funding for the GOES N series will allow NOAA to complete production of the GOES O and P satellites and allow for the launch of GOES O that year, currently planned for April, 2007.

For the GOES-R Series, prior year funding provided for critical design and development activities. The FY 2007 request provides continued engineering development and production activities for:

- The Advanced Baseline Imager (ABI), to meet the production schedule for launch and provide real-time environmental data and uninterruptible observations. Critical design review will occur during FY 2007.
- The Hyperspectral Environmental Suite (HES) to meet production schedule for launch and meet baseline requirements to provide real-time weather data and uninterruptible observations. The Acquisition and Operations (A&O) contract will be awarded in FY 2007.
- The Solar Imaging Suite (SIS) and Space Environmental In-Situ Suite (SEISS) preliminary design reviews.

The requested funding will initiate the development and production activities for the System Prime Acquisition and Operations (A&O) phase. The system prime contractor is responsible for the end-to-end system development and integration; the management of the instrument

development and production contracts will transition to the system prime as part of the A&O phase.

Considering the continued success of the GOES-I series, the current GOES-N series implementation, and the planned GOES-R development schedule, the GOES planning launch schedule is provided as Figure 1.

Figure 1 – GOES Launch Schedule

Spacecraft	Availability Date	Planned Launch Date	Operational Date
GOES-N	Dec 2004	TBD ASAP	TDB
GOES-O	Apr 2007	Apr 2007	Oct 2011
GOES-P	Apr 2007	Oct 2008	Jun 2013
GOES-R	Sep 2012	Sep 2012	Apr 2014
GOES-S	Apr 2014	Apr 2014	Apr 2018

The following five critical elements were the principal factors assessed during the review of GOES R-Series delivery schedule.

- Satellite Continuity. A critical requirement for the GOES program is to provide constant coverage over the continental United States. That need drives a two-satellite constellation – GOES East and GOES West. A key factor in determining when to deliver satellites is the need to ensure continuity of this service based on the projected operational lifetimes of the satellites currently in operation, in storage (ground and/or on-orbit), or already procured, or planned to be procured. The projected operational lifetime of a satellite is based on its design life and predicted reliability

- Launch/Early Orbit (L/EO) Failure Mitigation. A satellite is subject to failure to attain orbit or to achieve initial operating condition on-orbit. Satellite procurement schedules must include consideration of these types of failures. Although the risk of these types of failures remains relatively constant from satellite to satellite (i.e., the individual probability of failure for each satellite is essentially constant), as time passes the cumulative risk of future failures increases.

- Unpredicted, Premature Failure Mitigation. In addition to predictable failures associated with the satellite design and the possibility of L/EO complications, unpredicted and premature failures to achieve design lifetime must also be taken into account. Some examples of these types of failures include previously undetected design/build/test flaws, unpredicted wear-out failures, commanding errors, and collision/debris damage. These types of failures can be mitigated by either rapid launch on failure response or on-orbit storage. On-orbit storage has been adopted for the GOES program because these satellites are launched via scheduled commercial vehicles.

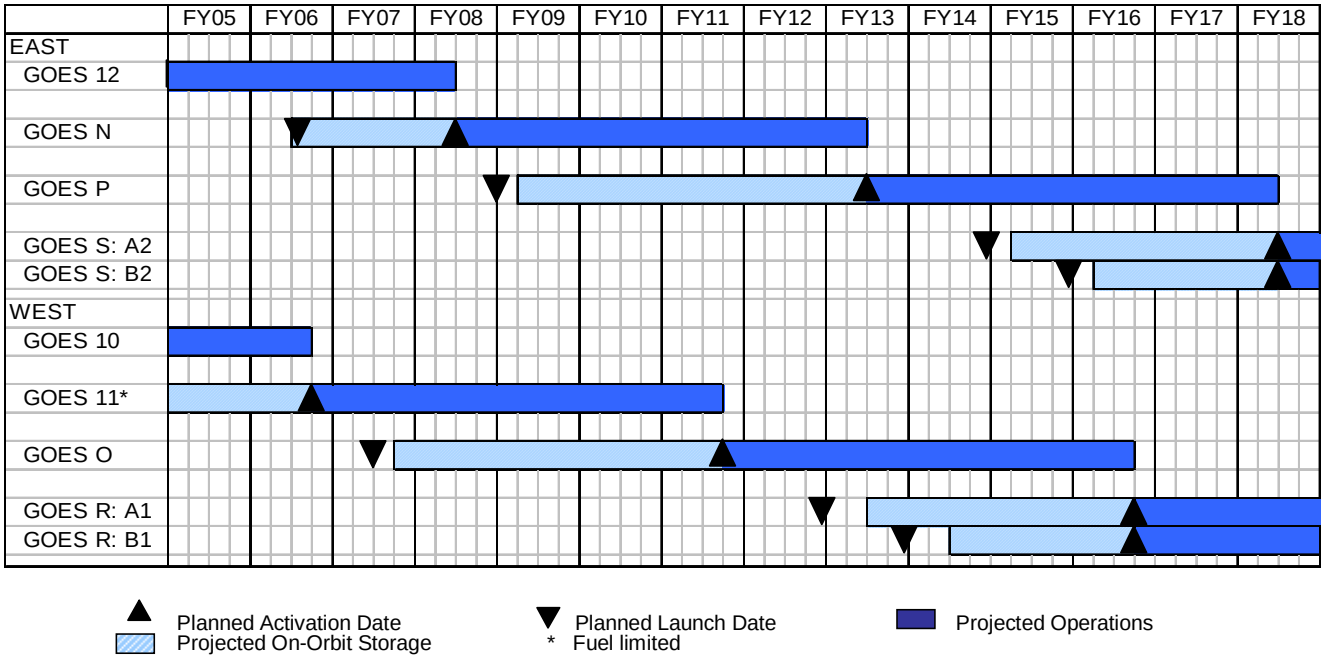
- Production/Launch/On-Orbiting Testing Constraints. The cost of integrating and testing satellites, caused by the high cost of engineering teams and facilities, limit the ability to deliver more than one satellite at a time and must be considered. For example, if two satellites are needed within three

months of each other to maintain continuity of service, production of the first must be accelerated to meet realistic production and launch schedules. In addition, the time to check-out a satellite and declare it operational must also be considered. This check-out period usually takes three months. However, for new satellites, this takes much longer – six months for certain individual capabilities and a year or more for the complete set of products and services.

- Fuel Reserves/On-orbit Storage Issues. While the storage mode for GOES is fairly benign and has a limited negative impact on satellite life, fuel reserves must be considered. Even during storage, a satellite's on-orbit fuel reserve is consumed to maintain station keeping. Launching a satellite too early can cause fuel limitations to be a significant service life-limiting factor.

Consideration of all of these factors led to the nominal projection of when to launch, store and operate the satellites. Once this nominal projection was derived, a statistical analysis was performed to assess the risk of providing continuity of service to the GOES national customers. Figure 2 shows the nominal operations projection and describes the associated probable availability of the system.

GOES Planned Launch and Operations Schedule



Benefits

Weather- and Climate-sensitive industries, both directly and indirectly, account for approximately $3.0 trillion of the United States gross domestic product (about one-third). Seasonal and interannual variations in climate, e.g. El Niño, led to economic impacts on the order of $25 billion for 1997-1998. Average annual damage from tornadoes, hurricanes, and floods is $11.4 billion with about 100 deaths annually. Approximately $4 billion per year is lost in economic efficiencies as a result of weather-related air traffic delays. Lightning causes between $4 and $5 billion in losses each year in the civilian sector with about 47 deaths and 303 injuries per year.

GOES-R series satellites minimize these losses by:

- Reducing uncertainty in long-term climate projections by providing data with higher spatial and spectral resolutions
- Improving forecasts by providing more rapid image and sounder scans allowing forecasters to make more timely forecasts and provide longer lead times for warnings of hurricanes, tornadoes and other severe weather events (in the agricultural sector it is estimated that better forecasts can result in $300 million savings annually)
- Providing improved continuous monitoring of solar flares and sunspots to allow warning of space radiation storms which degrade satellite and communications systems and endanger human life in space and on high altitude/latitude airline flights; also contributes to warnings of geomagnetic storms.
- Providing more accurate sea-surface temperature data that supports better predictions of onset of El Niño events. This provides lead time for planners to adequately manage resources that are necessary to offset losses.
- Providing new research products, such as ocean surface currents that support both ecosystems management and safety of marine navigation.
- Providing more accurate and timely warnings of the presence of airborne volcanic ash plumes that can seriously damage aircraft and jet engines and have the clear potential to cause serious aviation accidents.
- Providing improved infrared and new near infrared imaging distinguishing snow, ice, and fog to provide safe ground and air transportation and reducing economic inefficiencies.
- Providing finer spectral resolutions allowing air turbulence identification for aircraft routing and safety.
- Providing access to solar wind data to allow short term warnings of geomagnetic storms to customers, especially electrical utilities to plan for storm induced power interruptions and management of distribution systems to prevent massive outages.

Performance Goals and Measurement Data

This increase will support both objectives under the Department of Commerce Strategic Goal of "Observe, protect, and manage the Earth's resources to promote environmental needs". Specifically, this increase supports NOAA's four strategic mission goals by providing the satellite infrastructure to provide the necessary observations for global environmental monitoring, and the following performance measures:

GOES-R Series: Performance Goal: Weather & Water Performance Measure/Milestones: Support NOAA's goals by acquiring GOES satellite on schedule with proposed capabilities	**FY 2005**	**FY 2006**	**FY 2007**	**FY 2008**	**FY 2009**	**FY 2010**	**FY 2011**
Without Increase	Lost capability in GOES-R satellite and resulting loss of improvements for mission performance						
With Increase		Conduct ABI PDR Award GLM PDRR contract Award SIS A&O contract Award SEISS A&O contract Award prime PPDR contracts up to three contractors	Award of prime A&O contract Conduct ABI CDR Award HES, GLM A&O contracts Conduct SIS, SEISS PDRs	Begin PDR on prime A&O contract Conduct HES PDR Conduct SIS, SEISS CDRs Conduct GLM PDR	Begin CDR on prime A&O contract Conduct HES CDR Conduct GLM CDR	Delivery of ABI FM1	

OUTYEAR FUNDING ESTIMATES (BA in thousands)								
	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to complete*	Total
Geostationary Satellites - GOES								
Change from FY 2007 Base	-	104,039	192,079	199,563	230,501	202,371		
Total Request	4,082,793	439,607	532,079	539,563	570,501	542,371	3,497,331	10,208,677

*Outyear costs are estimates and are subject to change. Future requests will be determined through the annual budget process.

Polar-Operational Environmental Satellite Systems (POES) NOAA Polar K-N' (0 FTE, and -$11,861,000): NOAA requests 0 FTE and a decrease of $11,861,000 for a total request of $89,906,000 for the continuation of the POES program. POES is nearing the end of its production, with one remaining satellite to be launched, along with supporting commissioning of the first Metop satellite in FY 2007. On September 6, 2003, NOAA-N prime was involved in a serious accident at the contractor's facility. The damage to NOAA-N Prime was assessed, estimated rebuild costs were developed, and agreements negotiated. With NOAA's approval, a contract modification between NASA and Lockheed Martin to rebuild NOAA-N Prime was signed on September 29, 2004.

FY 2007 POES funding will be used for:

- Spacecraft & Metop
- Launching services
- NASA technical management
- The government program office
- Product development; and
- Ground systems and backup

Statement of Need

NOAA has the responsibility to provide forecasts and warnings for the United States, its territories, adjacent waters and ocean area, for the protection of life and property and the enhancement of the national economy. This mission requires an enduring capability to acquire global data, and the capability to process and disseminate to central processing centers and distributed direct users, environmental data on an extensive spatial range (global, regional and local) within a variety of time scales (minutes to days). These data include, but are not limited to: global imagery; cloud and precipitation parameters; atmospheric profiles of temperature, moisture, wind, aerosols and ozone; surface conditions concerning ice, snow and vegetation; ocean parameters of sea temperature, color and state; solar and in-situ space environment conditions. These data are critically needed for:

Severe storm and flood warnings;
Tropical cyclone (hurricane reconnaissance and warnings);
Hydrologic forecasts and forecasts of the ocean surface and internal structures;
Medium range forecast outlook (out to fifteen days);
Solar and space environmental forecasts;
Aviation forecasts (domestic, military, and international);
Forecasts of ice conditions;
Seasonal and inter-annual climate forecasts;
Decadal-scale monitoring of climate variability;
Assessment of long-term global environmental change;
Environmental air quality monitoring and emergency response;
Detection and analysis of fires and volcanic eruptions; and
Short-term and mesoscale forecasts.

Proposed Actions

NOAA-N was launched in May 2005. In FY 2007, NOAA-N Prime is scheduled for spacecraft level testing, pre-ship and pre-launch reviews in preparation for launching in December 2007. In FY 2007 and beyond, NOAA will continue Ground Systems support.

Performance Goals

The POES program supports both objectives under the Department of Commerce Strategic Goal of "Observe, protect, and manage the Earth's resources to promote environmental needs". Specifically, this supports NOAA's four strategic mission goals by providing the satellite infrastructure to provide the necessary observations for global environmental monitoring.

OUTYEAR FUNDING ESTIMATES
(BA in thousands)

	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to complete*	Total
POES - NOAA N & N'								
Change from FY 2007 Base	---	(11,861)	(40,365)	(60,754)	(60,967)	(71,299)		
Total Request	2,054,863	89,906	62,308	41,919	43,635	31,374	189,267	2,512,249

*Outyear costs are estimates and are subject to change. Future requests will be determined through the annual budget process.

National Polar-orbiting Operational Environmental Satellite System (NPOESS) (0 FTE, and +$20,278,000): NOAA is requesting 0 FTE and an increase of $20,278,000 for a total request of $337,870,000 for the continuation of the tri-agency NPOESS program that will replace the NOAA POES program after completion of the current NOAA K-N Prime series of satellites. This request represents NOAA's share of the converged NOAA/DoD/NASA program. In FY 2007, funds are required to continue the development and production of the NPOESS spacecraft and instruments, including the Visible Infrared Image radiometer (VIIRS), the Conical Microwave Imager Sounder (CMIS), the Cross-track Infrared Sounder (CrIS), the Ozone, Mapping and Profiler Suite (OMPS), the Aerosol Polarimetry Sensor (APS), and the Space Environmental Sensing Suite (SESS). Continued development of these instruments is critical for their timely and cost effective delivery.

The funding profile is based on the baseline in the FY 2006 President's Budget. Any changes due to cost or schedule issues will be reflected in future budget submissions. In response to concerns about the program's cost and schedule, the program's Executive Committee (EXCOM) has commissioned an Independent Program Assessment (IPA) to examine the overall NPOESS program. This assessment is helping us to better understand the problems with the program and more fully explore the various options for moving forward. In addition to the independent programmatic reviews, the EXCOM has asked the DOD's Cost Analysis and Improvement Group (CAIG) to provide an independent analysis of several IPA cost and schedule estimates. This group is made up of acquisition and technical experts who can help provide further confidence in the cost estimates being discussed for both the current NPOESS program and other options.

The NPOESS Program Director has notified the EXCOM that the program costs will likely exceed the plan by more than 25% regardless of which option is chosen to move the program forward. This notification initiated a series of events which are required under the Nunn-McCurdy process: The Office of the Secretary of Defense is responsible for certifying that:

40. The program is essential to National Security;
41. No alternatives with equal capability exist at equal or lesser cost;
42. The cost estimate is reasonable; and
43. The management structure is adequate for program success.

Four teams will be formed, each focused on a different aspect of the certification. The teams will meet for the first time in January 2006, and their work is expected to be complete by the end of March.

Statement of Need

National Polar-orbiting Operational Environmental Satellite System (NPOESS) is a program established to develop, acquire and operate the next generation of polar-orbiting environmental satellites. The NPOESS system will meet the requirements to replace NOAA's POES and DoD's DMSP systems. NPOESS was developed as a system consisting of six satellites and associated operations. In August 2002, NOAA selected Northrop Grumman Space Technology as the prime contractor responsible for building and deploying the total NPOESS program.

Proposed Actions

FY 2007 funds are required to:

4. Continue the acquisition and operations phase of the program, including total system architecture trades and design of the four major NPOESS segments:
   - Space
   - Interface data processing segment
   - Command, control, and communications
   - Launch support
5. Support mission readiness of antenna systems at high latitude mission recovery sites to support data acquisition functions for the NPOESS Preparatory Project (NPP). The NPP ground system must be in place to support the NPP spacecraft. The NPP is a major element of the risk reduction program for NPOESS.
6. Complete the integration of instruments planned to be flown on NPP
7. Complete the ground systems and algorithms necessary to acquire, process and distribute NPP data. These data are necessary for continuity of NASA's long-term climate data records and for early risk reduction and calibration and validation essential to the first NPOESS satellite.

Benefits

The NPOESS goal is to accomplish all functional efforts via the tri-agency program reducing costs for both civil and military environmental data. NPOESS is a complex combination of equipment (hardware/software), data services, and facilities required to attain environmental data and maintain continuity of timely data to civilian and military data users. Approximately 90% of the NPOESS FY 2007 budget is required to fund the SSPR contract that was awarded to Northrop Grumman Corporation.

Performance Goals and Measurement Data for NPOESS:

Performance measures supported are:
The percentage of planned contract milestones accomplished within 30 days of target,

This increase will support both objectives under the Department of Commerce Strategic Goal of "Observe, protect, and manage the Earth's resources to promote environmental needs". Specifically, this increase supports NOAA's four strategic mission goals by providing the satellite infrastructure to provide the necessary observations for global environmental monitoring, and the following performance measures:

Performance Measure	Without FY 2007 Increase	With FY 2007 Increase
Support NOAA's goals by acquiring NPOESS satellite on schedule with proposed capabilities	Increased delay in the NPOESS program milestones and impact to mission goal requirements	Milestones and Critical Path Elements Completed on revised Schedule

NPOESS Milestones

As discussed above, the NPOESS Program is undergoing a major restructure due to cost overruns on several instruments and the spacecraft development. All major program milestones are under review and will be affected by the alternative selected.

OUTYEAR FUNDING ESTIMATES (BA in thousands)								
	FY 2006 & Prior	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Cost to complete*	Total
Polar Orbiting Systems NPOESS								
Change from FY 2007 Base		20,278	22,865	(23,773)	52,874	84,925		
Total Request	1,566,857	337,870	343,863	297,225	373,872	405,923	723,083	4,048,693

*Outyear costs are estimates and are subject to change. Future requests will be determined through the annual budget process.

TERMINATIONS FOR FY 2007: The following programs, or portions thereof, are terminated in FY 2007: EOS and Advanced Polar Data Processing, Distribution & Archiving ($1,960,000), CIP - Single Point of Failure ($37,000) and Comprehensive Large Array Data Stewardship System (CLASS) ($2,335,000).

Program Support
Activity: Corporate Services

GOAL STATEMENT:

Continue the acquisition and improvement of major systems associated with financial management, facilities, and other functions of NOAA's overall corporate management.

BASE DESCRIPTION:

The objectives of this subactivity are to:

- Invest in the phased-in implementation of the Commerce Administrative Management System (CAMS)/NOAA financial-management system.
- Capture the costs of acquiring and/or improving capital assets used by NOAA in carrying out its varied missions.
- Realize procurement efficiencies, management accountability, and reflect full cost of acquisition and/or improvement of an asset.

CAMS became the official accounting system of record effective October 1, 2002, moving the CAMS program into the operations and maintenance mode of this NOAA-wide, high-technology, integrated financial system. Therefore, the CAMS' base ($15,229,000) was transferred from the Procurement, Acquisition and Construction (PAC) account to the Business Management Fund (BMF). CAMS includes 11 distinct but integrated modules, 19 interfaces, and over 240 maintenance tables that require on-going support, thus necessitating the transfer of funds to Operations, Research and Facilities (ORF) account.

In addition, as an adjustment to base, NOAA Maintenance – Backlog and Cyclical ($7,471,000) has been moved from the Program Support PAC account to the Facilities ORF account to reflect actual functions for which the funds are to be expended.

PROPOSED LEGISLATION:

None.

SUMMARIZED FINANCIAL DATA

(Dollars in thousands)

Procurement Acquisition and Construction	FY 2005 ACTUALS	FY 2006 CURRENTLY AVAILABLE	FY 2007 BASE PROGRAM	FY 2007 ESTIMATE	INCREASE / DECREASE
Line Item: Corporate Services					
AMNH	986	-	-	-	-
NOAA ICOSS Observing Systems (NOS)	-	8,876	-	-	-
Convert NOAA Weather Bouys with NDBC (NOS)	-	3,945	-	-	-
Coastal Global Ocean Observing System (NWS)	-	1,477	-	-	-
Strengthen US Tsunami Warning Network (NWS)	-	3,432	-	-	-
TOTAL	986	17,730	-	-	-
FTE	-	-	-	-	-

Note: The dollars in this table represent budget authority.

PROGRAM CHANGES FOR FY 2007:

None.